

Listing of the Claims:

Below is a listing of the status of all claims pending in the application.

Claim 1. Canceled.

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Claim 2 (previously amended). An ink jet recording device comprising:

a head formed with a plurality of nozzles;

a converting unit that converts recording data into driving data, the driving data including data sets defining driving pulses for corresponding ones of the plurality of nozzles;

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a feed unit that feeds a recording medium in a first direction;

an ejection element provided to each one of the plurality of nozzles for ejecting an ink droplet from the corresponding nozzle onto the recording medium in response to the driving data while the feed unit is feeding the recording medium in the first direction;

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a memory that stores nozzle profile data including waveform data and timing data for each of the plurality of nozzles, the waveform data and the timing data indicating a waveform and a generating timing, respectively, of the driving pulse for each one of the plurality of nozzles, wherein the converting unit converts the recording data into the driving data based on the nozzle profile data, and each of the driving pulses is defined by a plurality of data sets of the driving data; and

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an updating unit that updates the waveform data for each of the plurality of nozzles when a printing condition has been changed.

Claim 3 (previously amended). An ink jet recording device comprising:

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a head formed with a plurality of nozzles;

a converting unit that converts recording data into driving data, the driving data including data sets defining driving pulses for corresponding ones of the plurality of nozzles;

a feed unit that feeds a recording medium in a first direction;

an ejection element provided to each one of the plurality of nozzles for ejecting an ink droplet from the corresponding nozzle onto the recording medium in response to the driving data while the feed unit is feeding the recording medium in the first direction;

a memory that stores nozzle profile data including waveform data and timing data
 5 for each of the plurality of nozzles, the waveform data and the timing data indicating a waveform and a generating timing, respectively, of the driving pulse for each one of the plurality of nozzles, wherein the converting unit converts the recording data into the driving data based on the nozzle profile data, and each of the driving pulses is defined by a plurality of data sets of the driving data;

10 a designating unit that designates a target ink amount of the ink droplet and a target impact position on the recording medium on which the ink droplet impacts;

a measuring unit that measures a distance between the target impact position and an actual impact position on the recording medium where the ink droplet has impacted with respect to the first direction; and

15 an updating unit that updates the nozzle profile data based on the target impact position and the distance measured by the measuring unit.

Claim 4 (original). The ink jet recording device according to claim 3, wherein the updating unit includes a first unit and a second unit, the first unit updating the waveform
 20 data of the nozzle profile data so as to change the ejected ink amount of the ink droplet, the second unit updating the timing data of the nozzle profile data so as to control the actual impact position with respect to the first direction.

Claim 5 (original). The ink jet recording device according to claim 4, wherein each of
 25 the driving pulses includes a plurality of sub pulses which are determined by the waveform data, wherein adjacent two of the plurality of sub pulses are divided by a split time.

Claim 6 (original). The ink jet recording device according to claim 5, wherein each of
 30 the driving pulses has a time width which is determined by the waveform data of the nozzle profile data, and the first unit updates the waveform data so as to change at least

one of the time width of each of the driving pulses, the split time of each of the driving pulses, and a pulse duty of the driving pulses.

5 Claim 7 (original). The ink jet recording device according to claim 6, further comprising a smoothing unit provided to the driving element, wherein the driving element includes a piezoelectric element and an element driver that controls the piezoelectric element, the element driver outputting a driving signal to the piezoelectric element in response to the driving data, wherein the smoothing unit smoothes the driving signal output from the element driver.

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Claim 8 (previously amended). The ink jet recording device according to claim 3, further comprising a deflection electric field generating unit and a charging electric field generating unit, the deflection electric field generating a deflection electric field in a space defined between the recording medium and the head, the deflection electric field
15 having a field element in a second direction substantially perpendicular to the first direction and a third direction in which the ink droplet is ejected, the charging electric field generating unit generating a charging electric field in the plurality of nozzles, the charging electric field having a field element in the third direction.

20 Claim 9 (previously amended). The ink jet recording device according to claim 8, wherein the designating unit designates the target impact position on the recording medium on which the ink droplet impacts with respect to both the first direction and the second direction;

the measuring unit includes:

25 a first measuring unit that measures a first distance between the target impact position and an actual impact position on the recording medium where the ink droplet has impacted with respect to the first direction; and

a second measuring unit that measures a second distance between the target impact position and the actual impact position with respect to the second direction;

30 the updating unit updates the nozzle profile data based on the target impact position, the first distance, and the second distance.

Claim 10 (original). The ink jet recording device according to claim 9, wherein the updating unit includes:

5 a first unit that changes the waveform data, wherein each of the driving pulses includes a plurality of sub pulses and adjacent two of the sub pulses are separated by a split time, and wherein the first unit changes the waveform data so as to change one of the split time and a pulse duty of the plurality of the sub pulses, thereby changing the actual ink amount for each of the plurality of nozzles;

10 a second unit that changes the waveform data after the first unit has changed the waveform data, wherein each of the driving pulses has a time width, and the second unit changes the waveform data so as to change the time width, thereby controlling the actual impact position with respect to both the first direction and the second direction; and

15 a third unit that changes the timing data after the second unit has changed the waveform data so as to control the actual impact position with respect to the first direction for each of the plurality of nozzles.

Claim 11 (original). The ink jet recording device according to claim 10, further comprising a smoothing unit provided to the driving element, wherein the driving element includes a piezoelectric element and an element driver that controls the
20 piezoelectric element, the element driver outputting a driving signal to the piezoelectric element in response to the driving data, wherein the smoothing unit smoothes the driving signal output from the element driver.

Claim 12 (previously amended). An ink jet recording device comprising:

25 a head formed with a plurality of nozzles;

a converting unit that converts recording data into driving data, the driving data including data sets defining driving pulses for corresponding ones of the plurality of nozzles;

a feed unit that feeds a recording medium in a first direction;

an ejection element provided to each one of the plurality of nozzles for ejecting an ink droplet from the corresponding nozzle onto the recording medium in response to the driving data while the feed unit is feeding the recording medium in the first direction;

a memory that stores nozzle profile data including waveform data and timing data
 5 for each of the plurality of nozzles, the waveform data and the timing data indicating a waveform and a generating timing, respectively, of the driving pulse for each one of the plurality of nozzles, wherein the converting unit converts the recording data into the driving data based on the nozzle profile data, and each of the driving pulses is defined by a plurality of data sets of the driving data; and

10 a leveling unit that levels generating timings of the driving pulses by changing the timing data of the nozzle profile data.

Claim 13 (previously amended). An ink jet recording device comprising:

a head formed with a plurality of nozzles;

15 a converting unit that converts recording data into driving data, the driving data including data sets defining pulses for corresponding ones of the plurality of nozzles;


a feed unit that feeds a recording medium in a first direction;

an ejection element provided to each one of the plurality of nozzles for ejecting an ink droplet from the corresponding nozzle onto the recording medium in response to the
 20 driving data while the feed unit is feeding the recording medium in the first direction;

a memory that stores nozzle profile data including waveform data and timing data for each of the plurality of nozzles, the waveform data and the timing data indicating a waveform and a generating timing, respectively, of the driving pulse for each one of the plurality of nozzles, wherein the converting unit converts the recording data into the
 25 driving data based on the nozzle profile data, and each of the driving pulses is defined by a plurality of data sets of the driving data; and

a resolution changing unit that changes a time resolution, wherein each one of the plurality of data sets of driving data having an original time resolution, and the resolution setting unit that sets the original time resolution of each of the data sets to a

30 predetermined time resolution.

 Claim 14. (Original) The ink jet recording device according to claim 13, wherein the original time resolution determines the waveform of each of the driving pulses, and the predetermined time resolution determines the generating timing of each of the driving pulses.
